VALID UNTIL 5/4/07

APPENDIX 1 - ON-ROAD HEAVY-DUTY VEHICLES

Below is additional information pertaining to the On-Road Heavy-Duty Vehicle (HDV) category under AQMD's FY 2007 Carl Moyer Program (CMP). All information in **PA #2007-08** and this Appendix apply. For additional detail regarding this program category, refer to CARB's 2005 CMP Guidelines. In the case of any conflict between CARB guidelines and AQMD criteria, the more stringent criteria will prevail.

Applicants are further cautioned that CARB recently adopted Fleet Rules for refuse haulers, transit bus fleets and public fleets. Depending on the status of a regulated entity's fleet rule compliance, these vehicles may no longer be eligible for Moyer Program funding. Projects for applicants subject to the ARB Fleet Rules will be evaluated on a case-by-case basis to determine if there are any surplus emissions that remain eligible for Moyer Program incentives. Special data submittal requirements apply and are indicated in Attachment 1 of the Application Forms.

It is the Applicant's responsibility to check with AQMD's CMP web page for program clarifications, changes and updates. This page may be accessed at http://www.aqmd.gov/tao/implementation/carl_moyer_program_2001.html.

CARB MOYER PROGRAM RESOURCES

Applicants are highly encouraged to review CARB guidelines for additional requirements of the CMP. CARB guidelines are incorporated into AQMD's Moyer Program by reference. The 2005 CARB guidelines may be downloaded from:

http://www.arb.ca.gov/msprog/moyer/guidelines/revisions05.htm

On this web page, there are links to the four parts of the CARB 2005 CMP guidelines. These parts are described below for easy reference.

- Part I provides the Executive Summary, Program Overview and Administrative Requirements primarily applicable to air districts) for CARB's Carl Moyer Program. The link to Part I is http://www.arb.ca.gov/msprog/moyer/guidelines/2005_Carl_Moyer_Guidelines_Part1.pdf

- Part II provides the Project Criteria for each program category. The link to Part II is http://www.arb.ca.gov/msprog/moyer/guidelines/2005_Carl_Moyer_Guidelines_Part2.pdf

- Part III provides the Agricultural Assistance Program guidelines. Link to Part III at http://www.arb.ca.gov/msprog/moyer/guidelines/2005_Carl_Moyer_Guidelines_Part3.pdf

- Part IV is the Appendices section of the guidelines. The link to Part IV is http://www.arb.ca.gov/msprog/moyer/guidelines/2005_Carl_Moyer_Guidelines_Part4.pdf . This section includes the following Appendices.

    - Appendix A – Acronyms
    - Appendix B – Tables for Emission Reduction and Cost-Effectiveness Calculations
    - Appendix C – Cost-Effectiveness Calculation Methodology
    - Appendix D – Example Calculations
    - Appendix E – Description of Certification and Verification Executive Orders
    - Appendix F – Retrofit Emission Control Strategies
    - Appendix G – Description of Functional Equivalency of Non-Original Equipment Manufacturer Repowers and Rebuilt Engines for use in Repowers

HIGHLIGHTS FOR 2007

Reduced-emission on-road heavy-duty vehicle projects which include new alternative fuel vehicle purchase, vehicle engine replacement (alternative fuel repower), and engine retrofit, can be considered for incentive funding.

- The project cost-effectiveness limit is $14,300 per weighed ton of NOx, PM and ROG emissions reduced. A four (4) percent capital recovery factor is used for the cost-effectiveness calculation.

- Cost-effectiveness calculations are based on particulate matter (PM10), oxides of nitrogen (NOx), and reactive organic gases (ROG). The formula is provided below. AQMD staff will calculate the NOx, PM and ROG emissions reductions during the evaluation process.

$$\frac{\text{Annualized Cost (\$/year)}}{\text{NOx reductions + 20(combustion PM10 reductions) + ROG reductions (tons/year)}}$$

- Applicants **must** provide current vendor quotes, **obtained within the last 90 days**, with their application to document the incremental cost of implementing the proposed technology. This will require documentation of both the baseline and low-emission project costs. Applicants can request funding up to the full differential cost between an optionally certified low-emission vehicle/engine/equipment and its new base standard emission equivalent; however, less may actually be awarded, depending on the results of the cost-effectiveness evaluation.

- Applicants **must** also provide documentation covering the past two years that justifies the activity level projected for the vehicles (i.e., mileage logs, hour-meter records, business records, fuel receipts, etc.). Specifically, stop-and-go vehicle projects (i.e., refuse, street sweeper) that utilize a fuel-based calculation must provide fuel receipts for the past two years to justify the fuel consumption activity projected for the vehicle.

- All projects must be operational within eighteen (18) months of contract execution or by May 31, 2009, whichever is earlier.

- The new engine/equipment/vehicle must not have been purchased prior to the effective date of the contract.

- AQMD reserves the right to disqualify any application that does not comply with all applicable requirements including submission of a complete application package. For On-Road Equipment projects, this includes the main application as well as the information requested in Attachments 1 and 2 to the main application.

- AQMD will only fund alternative fuel projects for new purchases and repowers of on-road heavy duty vehicles under this PA. New diesel fueled vehicle/engine projects are eligible for CMP on-road funding under the Moyer Fleet Modernization Program which is a separate program. (Download the Program Announcement at http://aqmd.gov/rfp/attachments/2007/PA2007-01.doc) This PA is open until funding is fully allocated. Also, there will be a second program announcement in 2007 for this program when additional funding becomes available. Please check the AQMD website periodically for this new program at http://aqmd.gov/rfp/index.html.

- As indicated earlier, diesel engine *retrofits* with CARB-verified systems are eligible for program funding. The AQMD Moyer Program will fund the cost of purchase and installation of a CARB-verified diesel emission control device, not exceeding the CMP cost-effectiveness limit. For retrofit projects that only take credit for NOx reductions from a Level 3 DECS (because the PM10 reductions are already required by regulation), the baseline cost is 1/2 the proposed project cost. The maximum funding for such projects would be the retrofit cost minus the default cost.

  In order to include NOx emission reductions in the cost-effectiveness evaluation, the technology must be verified to reduce NOx emissions by at least 15 percent compared to the original engine certification level.

- The cost of the retrofit, and all filters needed during the project life, may be paid for with Carl Moyer Program funding provided it meets the weighted cost-effectiveness limit. CARB also determined that filter cleaning is an eligible cost provided the inclusion of the cost for filter cleaning, which may include the cost of service to clean the filter or a filter cleaning machine, does not exceed the cost-effectiveness limit.

- Part One of Attachment 1 of the AQMD Application Form requires that **all** repower and retrofit projects provide the vehicle identification numbers (VINs) for the project vehicles in both hard copy and electronic format. This information will be provided to ARB for an ARB Violation Compliance Check. Any outstanding violations for a project vehicle must be resolved in advance of contract execution.

- Part Two of Attachment 1 of the AQMD Application Form requires that **all** applicants subject to an ARB Fleet Rule (i.e., transit bus, solid waste collection vehicle, public fleets, etc.) must provide the information requested therein. The application will not be considered until ARB evaluates this information and indicates to the AQMD that the proposed project is indeed surplus to the regulation. The applicant is free to submit this information in advance of the application due date; AQMD will facilitate early ARB review of this information in order to determine program eligibility in advance of application preparation. A letter from CARB indicating the applicant is in compliance with applicable fleet rule(s), that also indicates the eligibility terms for the proposed project is acceptable, in lieu of the information required in Attachment 1, Part Two.
- Average Banking and Trading (ABT) engines (i.e., all Family Emission Limit (FEL)-certified engines) are not eligible to participate in the Carl Moyer Program for new vehicle purchase projects since emission benefits from an engine certified to an FEL level are not surplus emissions. FEL engines are eligible for repower projects, but the FEL emission levels are used as the baseline emissions for the cost-effectiveness evaluation.

- Pre- and Post-Inspection of all vehicles/engines approved for funding is required, as well as verification of engine destruction. Payment will be made only after all inspections are completed and engine/vehicle destruction is verified.

- See Section III – Project Types, and Section IV – Project Criteria for additional important information regarding CMP requirements.

- Please review CARB's CMP Guidelines, Part IV, Appendix E for a comprehensive description of certification Executive Orders for new engines and Verification Letters for retrofit devices.

EVALUATION METHODOLOGY

AQMD staff will evaluate all submitted proposals and make recommendations to the Governing Board for final selection of project(s) to be funded. Proposals will be evaluated based on the cost-effectiveness of emissions (NOx + ROG + 20*PM) reduced on an equipment-by-equipment basis, as well as a project's "disproportionate impact" evaluation (discussed below). Be aware of the possibility that due to program priorities and/or funding limitations, project applicants may be offered only partial funding, and not all proposals that meet minimum cost-effectiveness criteria may be funded.

In compliance with AB 1390, Firebaugh, the FY 2007 CMP requires that at least 50 percent of the funds be spent in areas that are disproportionately impacted by air pollution. CARB has issued broad goals and left the details of how to implement this requirement to each air agency. In the South Coast Air Quality Management District, the disproportionately impacted areas are defined by a weighted formula that includes poverty level, particulate matter exposure and toxic exposure. The process is described below:

1. All projects must qualify for the CMP by meeting the cost-effectiveness limits established in the PA.

2. All projects will be evaluated according to the following criteria to qualify for Disproportionate Impact funding:

    a. Poverty Level: All projects in areas where at least 10 percent of the population falls below the Federal poverty level based on the year 2000 census data, will be eligible to be included in this category, and

    b. PM Exposure: All projects in areas with the highest 15 percent of PM concentration will be eligible to be ranked in this category. The highest 15 percent of PM concentration is 46 micrograms per cubic meter and above, on an annual average, or

    c. Toxic Exposure: All projects listed in the Multiple Air Toxics Exposure Study in the South Coast Air Basin (MATES II) report[1] as having a cancer risk of 1,000 in a million and above will be eligible to be ranked in this category.

    Data for the poverty level and PM and toxic exposures were obtained from the U.S. Census, the 1998 AQMD monitoring data and Mates II study respectively.

3. Fifty percent of the funding available for this PA will be allocated among proposals located in disproportionately impacted areas. If the funding for disproportionately impacted areas is not exhausted with the outlined methodology, then staff will return to the Governing Board for direction. If

[1] Multiple Air Toxics Exposure Study in the South Coast Air Basin (MATES II), SCAQMD, March 2000.

funding requests exceed 50 percent of the total available funding, then all qualified projects will be ranked based on their disproportionate impact. Each project will be assigned a score that is comprised of 40 percent for poverty level, and 30 percent each for PM and toxic exposures. Proposals with the highest scores will receive funding until 50 percent of the total funding is allocated.

All the proposals not awarded under the fifty percent disproportionate impact funding analysis will then be ranked according to cost-effectiveness, with the most cost-effective project funded first and then in descending order for each funding category until the remainder of the CMP Funds are exhausted. Some projects that exceed the cost-effectiveness ceiling may receive partial funding, depending on their rankings.

ELIGIBLE COSTS

Eligible project costs (i.e., costs for which CMP funding is requested) are limited to the incremental cost of a project to implement the reduced emission technology. Operation and maintenance costs are not eligible for CMP funding, except for retrofit projects where filter cleaning is considered an eligible cost. CARB determined that filter maintenance is an eligible cost for retrofit projects provided the inclusion of the cost for filter cleaning, which may include the cost of service to clean the filter or a filter cleaning machine, does not exceed the cost-effectiveness limit. Please refer to the Project Types section below for additional detail.

PROJECT LIFE

As discussed above, a key parameter in the determination of a project's emission reduction benefit is its project life. The acceptable maximum life for calculating the project benefits of on-road vehicle projects is summarized below in Table 1.1. Applicants must provide documentation to justify a longer project life.

Table 1.1 – Maximum Project Life for On-Road Vehicle Projects

Vehicle Type	Maximum Life without Documentation
School buses > 33,000 GVWR – New	20 years
Buses > 33,000 GVWR - New	12 years
Other On-road – New	10 years
Repowers only	7 years
Repowers with Retrofits	5 years
Retrofits	5 years

REPORTING AND MONITORING

All participants in the CMP are required to keep appropriate records during the full contract period. Records must be retained and updated throughout the project life and made available for AQMD inspection. Project life is the number of years used to determine the cost-effectiveness and is equivalent to the contract life. All equipment must operate in the AQMD for this full project life. Periodic reviews of each project's operating records to ensure that the engine is operated as stated in the program application may be conducted by AQMD and/or ARB. Annual records must contain, at a minimum:

- Total miles traveled
- Total miles traveled in the South Coast Air Basin
- Annual fuel consumed
- Annual maintenance and repair information

Records must be retained and updated throughout the project life and made available for AQMD inspection. The AQMD/ARB may conduct periodic reviews of each vehicle/equipment project's operating records to ensure that the vehicle is operated as required by the project requirements.

COST-EFFECTIVENESS EVALUATION DISCUSSION

Cost-effectiveness calculations are based on particulate matter (PM10), oxides of nitrogen (NOx), and reactive organic gases (ROG). AQMD staff will calculate the NOx, PM and ROG emissions reductions and apply the new formula during the evaluation process. Only CMP funds are to be used in determining cost-effectiveness[2]. The one-time incentive grant amount is to be amortized over the project life (which is also the contract term) at a discount rate of 4 percent. The amortization formula (given below) yields a capital recovery factor (CRF), which, when multiplied by the initial capital cost, gives the annual cost of a project over its project term.

$$CRF = [(1 + i)^n (i)] / [(1 + i)^n - 1]$$

where

i = discount rate (4 percent)
n = project life (at least 3 years)

Table 1.2 lists the CRF for different project lives using a discount rate of 4 percent. Cost-effectiveness is determined by dividing the annualized costs of a project by the annual weighted emission reductions offered by the project.

[2] Unless the AQMD "buys down" the cost of the project by adding additional funding, in which case the total grant funding amount should be used for the cost-effectiveness calculation.

Table 1.2 – Capital Recovery Factors (CRF) for Various Project Lives At 4 Percent Discount Rate

Project Life	CRF
3	0.360
4	0.275
5	0.225
6	0.191
7	0.167
8	0.149
9	0.134
10	0.123
11	0.114
12	0.107
13	0.100
14	0.095
15	0.090
16	0.086
17	0.082
18	0.079
19	0.076
20	0.074

EXECUTIVE ORDER INTERPRETATION

CARB certifies engines destined for sale in California and provides the engine manufacturers with an Executive Order (EO) for each certified engine family. An example of an EO is shown in Figure 1.1. The EO includes general information about the certified engine such as engine family, displacement, horsepower rating(s), intended service class, and emission control systems. It also shows the applicable certification emission standards as well as the average emission levels measured during the actual certification test procedure. For the purpose of the CMP, the EO is used to ensure that an engine is eligible for CMP funding. Specifically, in the case where an EO shows emission values in the rows labeled "AVERAGE STD" and/or "FEL", the engine is certified for participation in an AB&T program. AB&T engines (i.e., all FEL-certified engines) are not eligible to participate in the CMP for new vehicle purchase projects since emission benefits from an engine certified to an FEL level are not surplus. FEL-certified engine projects may only participate in repower projects as discussed above.

Figure 1.1 – Sample Executive Order

California Environmental Protection Agency AIR RESOURCES BOARD	CUMMINS INC.	EXECUTIVE ORDER A-021-0340 New On-Road Heavy-Duty Engines

Pursuant to the authority vested in the Air Resources Board (ARB) by Health and Safety Code (HSC) Division 26 Part 5, Chapter 2; and pursuant to the authority vested in the undersigned by HSC Sections 39515 and 39516 and Executive Order (EO) G-02-003; and

Pursuant to the December 15, 1998 Settlement Agreement (SA) between ARB and the manufacturer, and any modifications thereof to the Settlement Agreement;

IT IS ORDERED AND RESOLVED: That the engine and emission control systems produced by the manufacturer are certified as described below for use in on-road motor vehicles with a manufacturer's GVWR over 14,000 pounds. Production engines shall be in all material respects the same as those for which certification is granted.

MODEL YEAR	ENGINE FAMILY	ENGINE SIZE (liter)	FUEL TYPE (CNG/LNG=compressed/liquefied natural gas; LPG=liquefied petroleum gas)	STANDARDS & TEST PROCEDURE	INTENDED SERVICE CLASS (L/M/H HDD=light/medium/heavy heavy-duty [HD] diesel; UB=urban bus; HDO=HD Otto)
2003	3CEXH0505CBK	8.3	CNG / LNG	Diesel	UB

SPECIAL FEATURES & EMISSION CONTROL SYSTEMS	ENGINE MODELS / CODES (rated power in horsepower, hp)
TBI, OC, HO2S, TC, CAC, PCM	CG-280 / 8012 (280 hp), CG-275 / 8009 (275 hp), CG-250 / 8006 (250 hp), CG-250 / 8003 (250 hp)

GVWR=gross vehicle weight rating TWC/OC=three-way/oxidizing catalyst WU (prefix) =warm-up cat. O2S=oxygen sensor HO2S=heated O2S TBI=throttle body fuel injection MFI=multi port fuel injection SFI=sequentialMFI DDI/DI=direct /indirect diesel injection TC/SC=turbo/super charger CAC=charge air cooler EGR=exhaust gas recirculation AIR=secondary air injection PAIR=pulsed AIR SPL=smoke puff limiter ECM/PCM=engine /powertrain control module EM=engine modification 2 (prefix)=parallel (2) (suffix)=in series HC=hydrocarbon NMHC=non-methane HC NOx=oxides of nitrogen CO=carbon monoxide PM=particulate matter HCHO=formaldehyde g/bhp-hr=grams per brake horsepower-hour

The following are the exhaust emission standards (STD), or family emission limit(s) (FEL) as applicable, and certification levels (CERT) for this engine family under the "Federal Test Procedure" (FTP) (Title 13, California Code of Regulations, (13 CCR) Section 1956.1 (urban bus) or 1956.8 (other than urban bus)), and under the "Euro III Test Procedure" (EURO) in the Settlement Agreement, including EURO's "Not-to-Exceed" standard(s). "Diesel" CO certification compliance may have been demonstrated pursuant to Code of Federal Regulations, Title 40, Part 86, Subpart A, Section 86.091-23(c)(2)(i) in lieu of testing. (For flexible- and dual-fueled engines, the CERT values in brackets [ ] are those when tested on conventional test fuel. For multi-fueled engines, the STD and CERT values for default operation permitted in 13 CCR Section 1956.1 or 1956.8 are in parentheses.)

	EURO'S NOT-TO-EXCEED STD		NMHC: *		NOx: *		NMHC+NOx: 2.25		PM: 0.0375					
* = not applicable	HC		NMHC		NOx		NMHC+NOx		CO		PM		HCHO	
	FTP	EURO	FTP	EURO	FTP	EURO	FTP	EURO	FTP	EURO	FTP	EURO	FTP	EURO
(DIRECT) STD	*	*	*	*	*	*	1.8	1.8	15.5	15.5	0.03	0.03	*	*
AVERAGE STD	*	*	*	*	*	*	*	*	*	*	*	*	*	*
FEL	*	*	*	*	*	*	*	*	*	*	*	*	*	*
CERT	*	*	*	*	*	*	1.7	1.4	2.0	1.3	0.01	0.005	*	*

BE IT FURTHER RESOLVED: That certification to the FEL(s) listed above, as applicable, is subject to the following terms, limitations and conditions. The FEL(s) is the emission level declared by the manufacturer and serves in lieu of an emission standard for certification purposes in any averaging, banking, or trading (ABT) programs. It will be used for determining compliance of any engine in this family and compliance with such ABT programs.

BE IT FURTHER RESOLVED: That the listed engine models have been certified to the FTP optional NOx, or NMHC+NOx as applicable, and PM emission standard(s) listed above pursuant to 13 CCR Section 1956.1 or 1956.8.

BE IT FURTHER RESOLVED: That for the listed engine models, the manufacturer has submitted the materials to demonstrate certification compliance with 13 CCR Sections 1965 (emission control labels), and 2035 et seq. (emission control warranty).

BE IT FURTHER RESOLVED: That the listed engine models are conditionally certified subject to the following conditions: (**1**) The SA is in effect; (**2**) The manufacturer is in compliance with all applicable California emission regulations, and all SA's applicable requirements and any modifications thereof; (**3**) This EO is void with respect to any engine within this family determined to have a defeat device as that term is defined in the test procedures and SA. Any engine produced under the voided EO remains subject to stipulated penalties under the SA. Such penalties would begin to accrue upon manufacture of the first engine under this EO; (**4**) This EO expires at midnight on December 31, 2002; (**5**) Production of any engine within this family under this EO is acceptance of all conditions in this EO; and (**6**) ARB reserves the right to disapprove certification of this family, or any families using the same or similar auxiliary emission control device (AECD) strategies as this family is employing, based on all available information.

The Bureau of Automotive Repair will be notified by copy of this Executive Order.
Executed at El Monte, California on this 2nd day of October 2002.

Allen Lyons, Chief
Mobile Source Operations Division

RECENT AND UPCOMING REGULATIONS

In addition to its existing SWCV and Transit Fleet Rules, CARB adopted an in-use diesel particulate control measure for public and utility fleets in December 2005 which significantly affects eligibility criteria for these projects. Due to low mileage, public fleet projects are generally only eligible for small grant amounts.

Private on-road heavy-duty diesel-fueled vehicle fleets such as in-use heavy-duty trucks are not currently regulated. However, CARB will consider a proposed diesel particulate control measure for private fleets in mid-2007 which may impact the project criteria for these projects.

VIOLATION COMPLIANCE CHECK

CARB requires a violation compliance check for all repower and retrofit projects. For these projects, the applicant must submit information regarding the project to AQMD to check for outstanding violations. The process for completing the compliance check is as follows:

- The AQMD shall email their ARB district liaison the contact name, organization or business name and vehicle identification number for the project. This information is provided to the AQMD from the applicant in accordance with Application Attachment 1, Part One.
- The liaison will forward that information electronically to the responsible parties at ARB. The liaison will email the district the results of the compliance check within seven working days.
- If the compliance check indicates there is an outstanding violation the district shall inform the vehicle/engine owner in writing that no disbursement may be made until the owner provides proof that the violation has been corrected and the fines have been paid.
- If the outstanding violation is based on problems with the baseline engine (e.g., gross polluter) the new engine must be installed (instead of fixing the old engine), the vehicle must be operational, the engine owner must pay the violation and submit documentation of the violation being corrected with, or before submitting, the invoice.
- During inspections, districts must also check for a sticker verifying engines subject to the software upgrades for diesel trucks (i.e., chip reflash) have completed the upgrade before receiving funding.

PROJECT CRITERIA

Reduced-emission on-road heavy-duty vehicle projects which include new alternative fuel vehicle purchase, vehicle engine replacement (alternative fuel repower), and engine retrofit, can be considered for incentive funding. The project criteria listed below for on-road heavy-duty vehicles provide districts, fleet operators, transit agencies, and applicants with the minimum qualifications for the Carl Moyer Program. The primary

criteria for selection are: emission reductions, cost-effectiveness, and ability for the project to be completed within the timeframe of the program. Sample calculations that illustrate the methodology for determining emission reductions and cost-effectiveness are included in Appendices C and D of Part IV of CARB's 2005 Guidelines. These may be downloaded from: http://www.arb.ca.gov/msprog/moyer/moyer.htm

A. General

- Emission reductions obtained through Carl Moyer Program projects must not be required by any federal, state or local regulation, memorandum of agreement/understanding with a regulatory agency, settlement agreement, mitigation requirement, or other legal mandate.
- Projects must meet a cost-effectiveness of $14,300 per weighed ton reduced (NOx + ROG + (20*PM10)), calculated in accordance with CARB's cost-effectiveness methodology.
- No emission reductions generated by the Carl Moyer Program shall be used as marketable emission reduction credits, or to offset any emission reduction obligation of any person or entity.
- No project funded by the Carl Moyer Program shall be used for credit under any federal or state emission averaging banking and trading program.
- Projects must have a minimum project life of three years. ARB may approve a shorter project life on a case-by-case basis. Projects with shorter lives may be subject to additional funding restrictions, such as a lower cost-effectiveness limit or a project cost cap.
- The contract term must extend to the end of the project life.
- Funded projects must have at least 75 percent of the vehicle's annual miles traveled or gallons consumed within the South Coast Air Basin.
- Potential projects that fall outside of these criteria may be considered on a case-by-case basis if evidence provided to the AQMD suggests potential surplus, real, quantifiable and enforceable emission reduction benefits.
- Vehicles operating under a compliance extension granted by CARB, a local district, or the U.S. EPA are not eligible for funding.
- Maximum project life for on-road projects are as follows:

School buses > 33,000 GVWR -New	20 years
Buses > 33,000 GVWR -New	12 years
Other On-road -New	10 years
Repowers only	5 years
Repowers with Retrofits	5 years
Retrofits	5 years

Applicants must provide documentation to justify a longer project life. The default project life does not consider upcoming regulatory requirements. A shorter

project life may be assigned due to regulatory requirements.

- On-road heavy-duty diesel vehicles with a gross vehicle weight rating between 8,501 and 14,000 pounds may be considered for Carl Moyer Program funding for new, repower and retrofit projects on a case-by-case basis.
- All engines in new purchases and repower projects must be certified by the ARB for sale in California and must comply with durability and warranty requirements.
- All aftermarket emission controls (retrofits) must be verified by ARB.
- Carl Moyer funds can not be used for fuel projects.

B. New Purchase

The following criteria apply to all on-road new vehicle purchases

- Projects must provide at least a 30 percent NOx emission reduction compared to baseline NOx emission factors for the specific vehicle type. Exceptions may be considered by CARB on a case-by-case basis.
- Fleets/agencies affected by upcoming fleet regulations may use Carl Moyer Program funding to purchase a new vehicle if the project life expires prior to the final compliance date for the reductions in the regulation. For example, if a project with a 3-year project life is funded in December 2007, the emission reductions must be surplus to any emission reductions that are required by any regulations that apply through December 2010.
- Fleets/agencies purchasing vehicles that will be affected by upcoming emission standards may use Carl Moyer funding to purchase a new vehicle up to the compliance date of the new standard.
- The Heavy-Duty Diesel-Engine and Vehicle Standard will be used as the baseline for determining eligibility for on-road new purchases. Engines and vehicles certified to the Heavy-Duty Otto-Cycle Engine Standard may be eligible if certified to a level equivalent to the current optional diesel standard or 30 percent less than the current diesel standard.
- From 2007 to 2009, new vehicle engines eligible for the Carl Moyer Program must be certified to a 0.2 g/bhp-hr NOx emission limit.
- Engines used in any ABT program are not eligible for funding in the NEW vehicle project category.

C. Repower

The following criteria apply to all on-road repower (engine replacement) projects.

- Repower replacement engines must be an ARB certified alternative fueled engine with a Model Year of 1991 or newer.
- On-road engine repowers are allowed only when the highest level CARB retrofit

is installed as part of the repower project[3]. Check the CARB diesel emission control system verification website for available systems at http://www.arb.ca.gov/diesel/verdev/verdev.htm

- If a repower project does not meet the weighted cost-effective limit due to the added cost of the retrofit, then the project is only eligible for the cost up to the weighted cost-effective limit.
- If no retrofit is shown to be technically feasible to the district and CARB, the retrofit is not required.
- Repower projects that reduce NOx emissions must be certified by CARB to reduce NOx emissions by at least 15 percent from the baseline engine.
- Fleets/agencies affected by upcoming fleet regulations may use Carl Moyer funding for repower projects if the project life expires prior to the final compliance date for the reductions in the regulation. For example, if a project with a 3-year project life is funded in December 2007, the emission reductions must be surplus to any emission reductions that are required by any regulations that apply through December 2010.
- Funding requests for other related repowering equipment, such as the vehicle transmission, will be considered on a case-by-case basis, based upon whether it is a necessary expense, and is at the discretion of the district.
- The full cost of a retrofit kit (i.e., VDECS) included in a repower project may be funded subject to the $14,300 weighted cost-effectiveness limit.
- The replacement engine used in vehicle repower projects may be a new, rebuilt, or remanufactured engine. Eligible rebuilt or remanufactured engines are those offered by the original engine manufacturer (OEM) or by a non-OEM rebuilder who demonstrates to the ARB that the rebuilt engine and parts are functionally equivalent from an emissions and durability standpoint to the OEM engine and components being replaced. Rebuild and remanufactured engines that are not re-certified to new emission standards, shall use the emission standards associated with the original engine block.
- For repowers, replacement engines manufactured after September 30, 2002, that are not certified to at least the 2.4 g/bhp-hr NOx + NMHC, or 2.5 g/bhp-hr NOx + NMHC with a 0.5 g/bhp-hr NMHC cap, are ineligible to participate in the Carl Moyer Program.
- Engines that are certified to a FEL NOx or NOx + NMHC level that is lower than the required emission standard are eligible for use in vehicle repower projects. However, the emission level that can be used in cost-effectiveness calculations for these engines would be the applicable emission standards from the EO, and

[3] CARB guidance requires the applicant to select the highest level technology that provides the most emission reductions. For many on-road projects, this includes a diesel emission control device that reduces both PM and NOx emissions. In order to be eligible for CMP funding, the retrofit device must be verified for the specific engine family found on the equipment and achieve the highest level emission reductions when compared to other verified retrofit devices.

not the FEL levels.

D. Retrofit

The following criteria apply to all on-road retrofit projects:

- Only ARB-verified retrofits are eligible for funding.
- Retrofit projects that reduce NOx emissions must be verified by CARB to reduce NOx emissions by at least 15 percent from the baseline engine.
- Retrofit projects that control PM must use the highest level[4] technology available for the equipment being retrofitted. The following are the diesel PM reductions for each ARB verified level: Level 1 (25 percent reduction), Level 2 (50 percent reduction), or Level 3 (85 percent reduction).
- Fleets/agencies affected by upcoming fleet regulations may use Carl Moyer funding for retrofit projects if the project life expires prior to the final compliance date for the reductions in the regulation. For example, if a project with a 3-year project life is funded in December 2007, the emission reductions must be surplus to any emission reductions that are required by any regulations that apply through December 2010.
- If the retrofit device reduces both NOx and PM emissions and is being installed to comply with a PM requirement, only the cost of the NOx reductions is eligible for Carl Moyer Program funding. Grant funding is limited to 50 percent of the total project cost.
- The cost of the retrofit, and all filters needed during the project life, may be paid for with Carl Moyer Program funding provided it meets the weighted cost-effectiveness limit. CARB also determined that filter cleaning is an eligible cost provided the inclusion of the cost for filter cleaning, which may include the cost of service to clean the filter or a filter cleaning machine, does not exceed the cost-effectiveness limit
- Only designated engine families for specified model years are compatible with CARB-verified diesel exhaust after-treatment devices. CARB certification levels and information are continually being updated. Applicants are required to provide engine family numbers and submit verification letters as part of the application. Verification letters as well as current information can be found at www.arb.ca.gov/diesel/verdev/verdev.htm.

OLD ENGINE SCRAP REQUIREMENTS

For repowers, the existing (old) engine must be destroyed and rendered useless. There must be no cannibalization of parts from the old engine. Engines must have a complete

[4] CARB guidance requires the applicant to select the highest level technology that provides the most emission reductions. For many on-road projects, this includes a diesel emission control device that reduces both PM and NOx emissions. In order to be eligible for CMP funding, the retrofit device must be verified for the specific engine family found on the equipment and achieve the highest level emission reductions when compared to other verified retrofit devices.

and fully visible and legible engine serial number in order to be eligible for an engine repower. The destruction of the engine must be documented by visual inspection of the destroyed engine by AQMD staff, or the receipt from the qualified vehicle salvage yard (see appendix for definition). Engines without a visible and legible serial number may be repowered if district staff stamps the engine block with the Moyer Program project number and the district staff is present to personally verify engine removal from the project vehicle or equipment and the subsequent engine destruction. CARB will consider alternatives to stamping the engine block on a district-by-district basis.

COST-EFFECTIVENESS CALCULATIONS

To receive Carl Moyer Program funding, each project must meet the maximum cost-effectiveness threshold of $14,300 per weighted ton of covered pollutants reduced. Only funds provided by the Carl Moyer Program and local district matching funds are to be used in determining cost-effectiveness.

The emission factors in the tables of CARB CMP Guidelines, Part IV, Appendix B reflect preliminary data developed by ARB staff as part of a comprehensive effort to update the emissions models used for on-road motor vehicles and off-road mobile sources. These draft data were made available on ARB's website in early 2005, but are subject to change as staff completes its analyses and the associated model development. Appropriate emission factors as a function of vehicle type and model year are illustrated in Appendix B. ARB staff will issue Carl Moyer Program Advisories to update the tables as necessary. These advisories may be accessed at http://www.arb.ca.gov/msprog/moyer/advisories_005/advisories_005.htm

The converted emission standards used in the calculations are the standards described in the emission standard section of this chapter that have been adjusted using the fuel correction factors and NOx fraction factors in Appendix B. It is important to note that urban buses have different standards than other heavy-duty vehicles.

Special Calculation Notes

On-road project calculations are generally mileage based. However, some projects such as stop-and-go vehicles can use fuel-based calculations.

For new purchase projects, the baseline will be an engine certified to the current standard. The reduced technology will be an engine certified to the current optional standard or 30 percent less than the current standard. For repower projects, the baseline will be the model year of the existing engine that would have been rebuilt. The reduced technology will be the engine certified to at least 5.0 g/bhp-hr of NOx that will be installed instead of the rebuilt engine. The baseline for a retrofit project is the existing engine. The reduced technology level reflects the verified level of emission reductions for the retrofit.

A detailed description of CMP cost-effectiveness methodology can be found in Part IV, Appendices C and D of CARB's CMP Guidelines, which may be downloaded at http://www.arb.ca.gov/msprog/moyer/guidelines/revisions05.htm